

SEPTEMBER 15, 1997 • VOLUME 3, ISSUE 9

COMPUTERWORLD

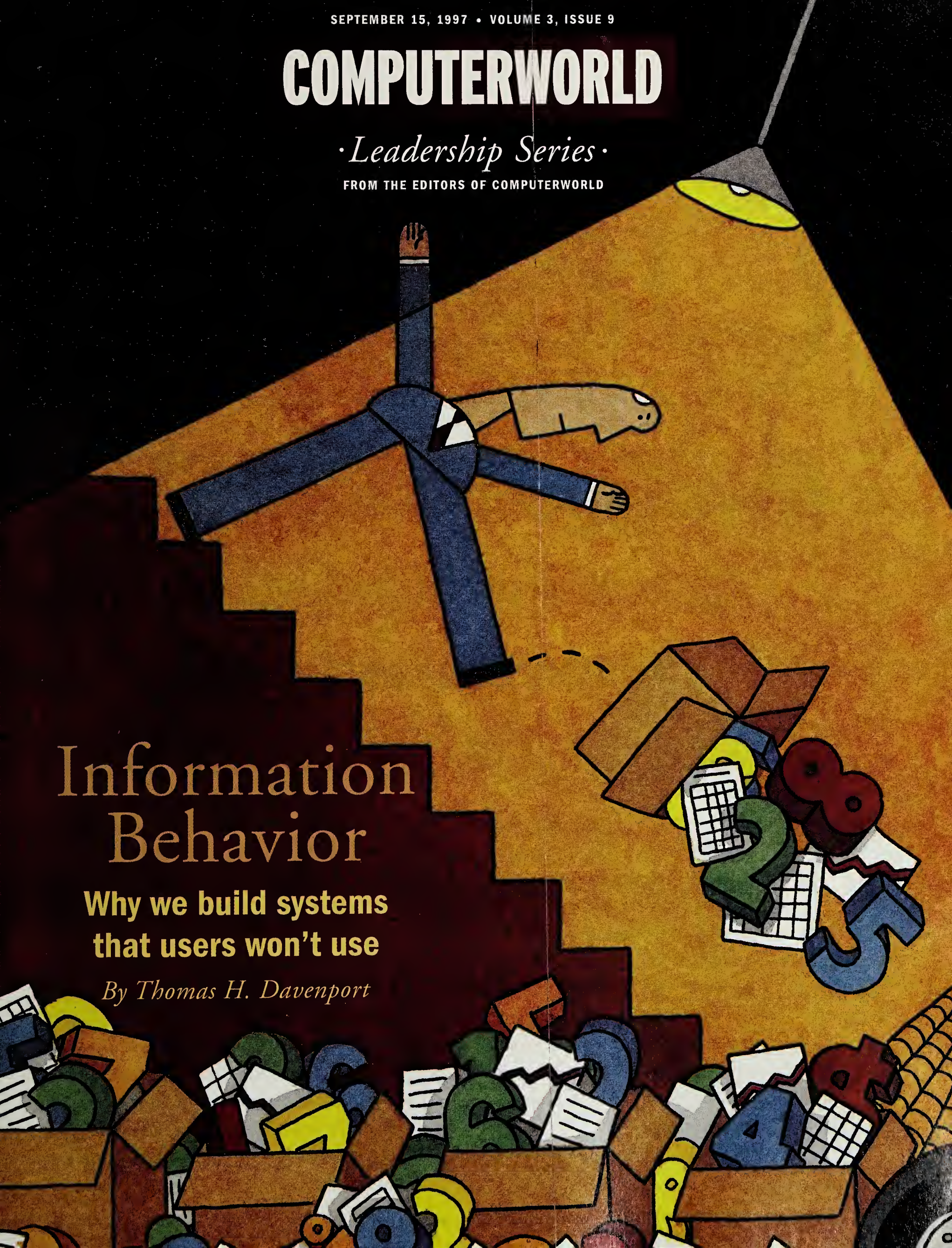
· *Leadership Series* ·

FROM THE EDITORS OF COMPUTERWORLD

Information Behavior

**Why we build systems
that users won't use**

By Thomas H. Davenport





Applications that gather dust. Technology that's ignored. IS groups will continue to ignore users until they pay attention to Information Systems

Hughes Space and Communications Co., the world's largest producer of satellites, had a good problem and a bad problem.

The good problem was that it needed to build more satellites in a shorter time than ever before. The bad problem was poor production scheduling; some work cells were overloaded while others sat empty. Nobody seemed to have accurate scheduling information.

Hughes' information technology profes-

sionals concluded that a new common scheduling system was necessary and installed an expensive mainframe package. No one used it. Reasoning that the problem was the difficult-to-use mainframe interface, at great expense, they trashed the first system and built a client/server, graphical user interface scheduling system on top of Microsoft Corp.'s Project. Again, no one used it.

After detailed analysis, the project manager realized the problem was information behavior — how people approach and handle information. At Hughes, for example,

work cell managers were penalized when the schedule showed they would be late, so they kept mum about delays. They saw scheduling information as a powerful token to use in the organization's political negotiations.

The situation changed when the IT organization dealt with the politics head-on, getting work cell managers to discuss what information they'd be willing to share and convincing senior management to stop punishing those who admitted to being late. The second system is now being used. Best of all, the company continues its record of never missing a launch date.

Few would question that information behavior is important to the success of information systems. But in most companies, the

Almost every IT professional knows of systems that did not meet their business objectives because of "incorrect" information behaviors by users. But neither the words "information behavior" nor any real synonyms ever appear in development methodologies, joint application design sessions or project team meetings.

IT professionals may not feel ready to change users' information behaviors. But several key steps will make good information behaviors more likely. If we in IS don't do it, no one will — and we'll continue to build systems that aren't used, install technologies that aren't understood and distribute information that's ignored.

The greatest benefit from thinking about

ologies no one understands. Information inve to build systems that beg for ormation Behavior.

questions of how people search for, use, modify and share information — or how they hoard and ignore it — have been ignored.

Take a simple example: how people read electronic mail. One user plows through each message in turn, answers each immediately and files saved messages in subject folders. Another picks through his in-box, puts off responses until later and leaves saved messages in a huge, undifferentiated pile. Same technology, same information, but different behaviors, and one is much better than the other.

information behavior may be in canceling projects that won't work. Senior managers will have increased respect for IT professionals when we start saying, "This system shouldn't be built because it won't be used," or "This system would be a lot more effective if we used simpler, existing technologies and focused on the information instead."

Information behavior affects how we plan, develop and implement technologies. If we want to succeed with these activities, we must be aware of the laws of information behavior.

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1.

Information Behavior in Planning

Planning for information is a key task of the information professional. We create models, architectures, policies and standards to govern how information flows around the organization. Attempts to create information architecture in particular have failed miserably because they frequently violate the first law of information behavior:

INFORMATION PLANS MUST BE SIMPLE AND EASILY UNDERSTOOD TO HAVE ANY LIKELIHOOD OF AFFECTING BEHAVIOR.

The complex models that accompany information architectures are typically understood only by their creators. Often, even other IT professionals don't

understand them. As a result, they don't change anyone's behavior. Both users and IT professionals build "renegade" systems because the plans and architectures make no sense to them. In "real" architecture, architects have detailed blueprints for buildings, but they use less complex sketches to discuss with the client how the structure will look and feel. Information architects ought to follow their example.

KEEP PLANS SMALL SO MANAGERS CAN GET INVOLVED IN SHAPING THEM.

Information planning for entire enterprises has a particularly poor success record. For example, managers at Xerox Corp. say they tried it for 25 years and never succeeded. Most users don't care about what information the enterprise uses, only their part of it. While some information must be common so it can be shared across a corporation, it's rare that all of it needs to be. The best information plans concern small business units where line managers can debate what information is needed and what terminology should be used and match information objectives to business plans. If they participate in the planning, there's a much greater likelihood they'll abide by the finished plan.

DETERMINE WHAT INFORMATION BEHAVIORS YOU NEED.

If you don't know what behaviors you need, you probably won't get them. Identifying what behaviors are needed should be part of the planning process. If you're planning a group calendaring system, think about the behaviors you will have to encourage: getting people to check their calendars every morning, fill out all the neces-

sary information and not schedule other people to attend a meeting without asking them directly. When the desired behaviors are identified, ways to encourage, elicit and measure them can also be created.

The best example of such planning is at American Airlines. After years of more traditional (and generally unsuccessful) data modeling aimed at creating common information, American's IT professionals began planning within small business units — Sabre Travel Information Network or the airplane maintenance business — and kept the resulting information models on one page. They used the language of the business and involved key managers in planning meetings. They identified behavioral objectives of the planning exercise, most notably getting managers to realize their information creation and use activities overlapped. ("You do a demand forecast? So do I. Let's cooperate on one.") The process was simple and straightforward and led to sharing and consensus on common data that American's IT professionals wanted.

2.

Information Behavior in System Development

Most of what information professionals do today involves developing specific systems for managing information. These systems are typically quite capable from a technological stand-



Other Assorted Laws of Information Behavior

- The more an organization knows and cares about a particular business entity, the less likely its members are to agree on a common term and meaning for it.
- Information and knowledge sharing are unnatural acts; they can be encouraged, but they don't happen automatically.
- We exchange information most readily with those whose desks are within 90 feet of ours.
- Information consumption is a zero-sum game; if we consume more of one type, we'll probably consume less of another.
- Companies that achieve rapid, early success are likely to have cultures that emphasize intuition over information.
- Textual information on printouts or screens is one of the least engaging forms of communication, and graphics are little better; more active information roles (discussing, simulating, etc.) lead to higher engagement.



point but may ignore some other laws of information behavior. For example:

PEOPLE DON'T KNOW WHAT INFORMATION THEY NEED.

For years, a key method of determining information requirements was simply to ask people what information they needed. But it's well-known that few managers or employees have a good handle on their own information needs. Prototyping, of course, has been a great help in this regard; it's much easier for users to look at a screen and say, "No, that's not it," or "It would be better if you added this field." But it's hard to build a prototype unless you have a fairly good idea of the required information.

Rather than asking what information is needed, it's often most useful to simply observe people as they work. This way you can see what information they need. This approach, which is sometimes called "shadowing," requires information profes-

sionals who can make inferences about information requirements from work processes.

HUMANS PREFER INFORMATION AND KNOWLEDGE OVER DATA.

For 40 years we've managed data and called it information. But people prefer richer information diets — information with human context, experience, insight and elaboration. Increasingly, we call this "knowledge" and the systems that manage it, "knowledge management" systems. Whatever we call the systems we build, we should try to capture and process not only numbers but the contextual text, graphics and even video that add information value. Of course, the intelligence and knowledge embodied in such systems originate in peoples' heads and extracting it involves even more behavioral issues.

INFORMATION DESIRES CHANGE OVER TIME.

Computer science classes taught us that processes may vary over

time, but information stays constant. Dead wrong. The information we want changes over time, sometimes dramatically. New business requirements, new organizational structures, new business process designs all lead to new information requirements. But in the IS community, we are notorious for pouring "Cobol concrete" around businesses. Information professionals who are aware of information behavior will attempt to build as much flexibility as possible into information systems. They don't overengineer systems and frequently ask their customers, "What's changed since we last talked?"

An excellent example is Hoffman-LaRoche, the global pharmaceutical company in Basel, Switzerland. In building a system for the new drug development process, it hired anthropologists to shadow key researchers and learn what information they might find useful. The system modeled not only information flows but also the





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knowledge about what makes a drug successful with regulators and in the marketplace. The system is continually evolving, and although it's only 2 years old, it has gone through several versions. Most importantly, new drugs are coming out an average of six months earlier. Hoffman-LaRoche's system was also behaviorally-oriented while in planning mode, with high levels of involvement by scientists and other stakeholders. The information flows were originally recorded in a highly structured set of paper books because that was viewed as the best way to engage the users of the information and knowledge. Then they were put into a computer system that was easy to modify.

3. Applying Technologies to Information Problems

Many IT professionals view their primary job as installing technology to solve information problems. But even when the focus is on technology, it is possible to let behavior play a strong role. Organizations and individuals have preferences for particular technologies that may be independent of technical merits. Information professionals must give technology its due while focusing heavily on the interaction between human traits and technological opportunities. In doing so, they should be conscious of the following laws:

KNOW YOUR ORGANIZATION'S TECHNOLOGY PREFERENCES.

Every organization leans toward particular technologies for processing and communicating information. I've come across E-mail cultures, voice-mail cultures, spreadsheet cultures and even overhead transparency cultures. The reasons for these preferences may be buried in history or the actions of influential individuals. The biases may be well-suited to the organization's needs or may seem irrational. For example, I once worked at a consulting firm with a strong E-mail culture even though the consultants traveled often and, in those prelaptop days, didn't have access to E-mail. Such cultures can be changed, but it takes time and power, and information professionals may not be well-positioned to create such changes. Get familiar with the technology preferences of your culture. You tinker with them at your own peril.

KEEP THE TECHNOLOGY SIMPLE.

This law applies to much of our lives, but it is often violated with regard to technology. Many systems exceed the ability of users

to understand and use them effectively on a daily basis. Complex functions won't be used by most people. Witness the many functions of Lotus Development Corp.'s Notes that go unused in most firms. Even the most basic personal productivity software is called "bloatware" because it's overloaded with unnecessary functions.

IT professionals should strive to simplify technology environments and build only the necessary capabilities into systems and architectures. It may even be desirable to outsource some complex technological responsibilities in order to focus on information and behavior issues. Equifax, Inc., the Atlanta-based business information provider, points to its outsourcing of data center and network functions as the primary factor in a flowering of new information products and services based on credit information.

DON'T JUST TRAIN, EDUCATE.

Most organizations offer training on how to use technologies. It's generally adequate at best; many users have only a dim view of how to use particular software



and hardware capabilities. For example, think about the uncertain response you probably received the last time you asked someone to transfer you to another extension — and we've been able to transfer calls for more than 20 years.

What's particularly lacking, however, is education on how technology and information can be used effectively in the context of particular jobs and companies. Users are on their own to figure out how best to use information to meet their job objectives. Education is more difficult to develop and deliver than generic training, but it's far more valuable.

Consider Verifone, Inc., a fast-growing point-of-sale technology firm in Redwood City, Calif., that was recently acquired by Hewlett-Packard Co. Will Pape, formerly Verifone's chief information officer, said he believes in using the appropriate technology. "You don't need a Ferrari to drive to the grocery store, and you don't need a Pentium to do word processing," he argues. Those who need advanced technologies can get them, but most employees don't need them.

Verifone hasn't outsourced, but its technology environment is as simple as can be. Many applications are built on top of an old Digital Equipment Corp. VAX-based E-mail system. The

company puts its primary efforts into educating people about how to work effectively using its technologies and applications; 160 "information tools" have been constructed to allow access to and analysis of information: *Vview* is for viewing and analysis of Verifone financial performance; *Today* is a source for internal communications documents such as newsletters and job postings; and *VF Itin* contains the itineraries of employees who are traveling.

Verifone makes its technology preferences clear. The entire organization runs on E-mail and networked applications, and new employees are told about the need for mastering the technology before they start work.

As these examples illustrate, there's a lot more to building effective information environments than just throwing a computer at the problems. Putting in an intranet will not make employees care any more about the personnel manual than they did with the paper version. Lotus Notes will not necessarily lead to more information sharing.

Humans beings are remarkably ingenious in their ability to ignore, work around or subvert information initiatives that they don't see as being in their best interest.

It's time to stop cursing these recalcitrant customers and take their information behaviors seriously. ■

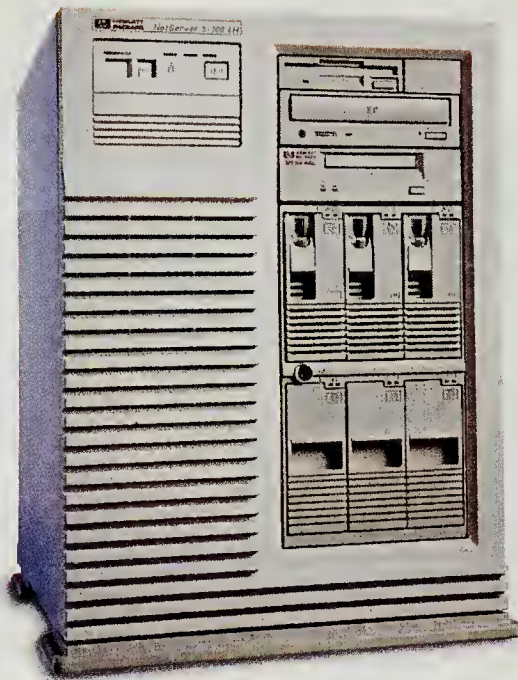


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Thomas H. Davenport is a professor and director of the information management MBA program at the University of Texas at Austin. His new book, *Information Ecology: Mastering the Information and Knowledge Environment* (Oxford University Press), describes how information behavior and other new factors can lead to more effective information management. *Working Knowledge* (Harvard Business School Press) with Larry Prusak will be published in November. His E-mail address is davenport@mail.utexas.edu.

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